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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/945,010	08/31/2001	Dumitru Mihai Ionescu	NC17524 (NOK102-17524)	1618
30973	7590	04/15/2004	EXAMINER	
SCHEEF & STONE, L.L.P. 5956 SHERRY LANE SUITE 1400 DALLAS, TX 75225			NGUYEN, DUNG X	
			ART UNIT	PAPER NUMBER
			2631	8

DATE MAILED: 04/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/945,010

Applicant(s)

IONESCU, DUMITRU MIHAI

Examiner

Dung X Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1, 3, 5 - 15, 17 - 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5 - 15, and 17 - 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

***Response to Arguments***

1. Applicant's arguments filed on 24 February 2004 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the newfound reference(s). Claims 2, 4, and 16 have been canceled.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

*The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.*

3. **Claim 14 is rejected** under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 14, line 2, the statement of "to receive comprises" is not cleared.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

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5. **Claims 1, 3, 5 - 7, and 19 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Hammons, Jr. et al. (US patent # 6,678,263 B1), and further in view of Alard et al. (US patent # 6,263,029 B1).

Regarding claim 1, Hammons, Jr. et al. discloses:

- An encoder comprising a first systematic structure (see block 58 of figure 2 and column 1, lines 63 – 67);
- That encoder having a recursive (recursive means for a feedback loop, one can see more details on de Lind van Wijngaarden et al. in US patent # 6,241, 778 B1, figure 2B, column 1, lines 42 – 44 or Werbos in US patent # 6,532,454 B1, figure 1, or Alard et al. in US patent # 6,263,029 B1, lines 29 - 30) convolutional codes (see column 17, lines 47 – 59);
- That encoder coupled to receive values representative of the data to be communicated upon the communication channel;
- That encoder encodes the values representative of the data into encoded form, the encoded form forming a codeword of a recursive, systematic space-time code achieved using a space-time constellation (column 2, lines 1 – 11).

Hammons, Jr. et al. differs from the instant claimed invention that it does not show the codeword complying with an equal eigenvalue criterion.

However, Alard et al. discloses the encoded elements complying with an equal eigenvalue criterion (column 3, lines 53 – 63, column 6, line 63 to column 7, line 4, and column 13, lines 62 - 65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Hammons, Jr. et al. and Alard et al. to provide the codeword complying with an equal eigenvalue criterion for improving the communication system.

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Regarding claim 3, Hammons, Jr. et al. further discloses that the encoder analyzed in claim 1, wherein the systematic part is formed of untransformed values of the values representative of the data (see column 5, lines 46 – 62, the unmodulated codewords are also means for untransformed values of the codewords).

Regarding claim 5, Hammons, Jr. et al. further discloses that wherein the codeword of the systematic space-time code into which the encoder encodes the values representative of the data including parity values, the parity values being derived from the values representative of the data (column 13, line 63 to column 14. line 3).

Regarding claim 6, Hammons, Jr. et al. further discloses that wherein the codeword of the systematic space-time code, into which the encoder encodes the values representative of the data, comprises at least one systematic symbol and at least one parity value (column 11, line 47 to column 14. line 3).

Regarding claim 7, Hammons, Jr. et al. and Alard et al. differ from the instant claimed invention that they do not show the sending station comprising a fixed-site transceiver.

However, the main point here is the encoder, the sending station comprising a fixed-site transceiver having an encoder is on hand of one in ordinary skill of the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement Hammons, Jr. et al. and Alard et al. to provide the sending station comprising a fixed-site transceiver having an encoder for improving the communication system.

Regarding claim 19, the limitations are analyzed in the same manner set forth as the combination of claims 1 and 2).

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6. **Claims 8 - 13, and 15 - 18 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Hammons, Jr. et al. (US patent # 6,678,263 B1), Alard et al. (US patent # 6,263,029 B1), and further in view of Raleigh et al. (US patent # 6,452,981 B1).

Regarding claim 8, Hammons, Jr. et al. and Alard et al. differ from the instant claimed invention that they do not show that wherein the encoder comprises a coset selecting coder couple to receive at least one of the first values, the coset selecting coder for producing coset addressing values.

However, Raleigh et al. discloses a selecting encoder coupled to receive information (column 24, line 43 to column 25, line 21). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to be easily producing coset addressing values.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Hammons, Jr. et al., Alard et al., and Raleigh et al. to provide the fulfilled limitations of the instant claimed invention for improving the communication system.

Regarding claim 9, Hammons, Jr. et al., Alard et al., and Raleigh et al. differ from the instant claimed invention that they do not show that wherein at least one part of the coset addressing values produced by the coset selecting coder comprises a parity value.

However, Hammons, Jr. et al. discloses the use of parity bits within the encoder (column 21, lines 43 – 47).

While Raleigh et al. discloses a selecting encoder coupled to receive information (column 24, line 43 to column 25, line 21), which comprises bits. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to be easily producing coset addressing values.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Hammons, Jr. et al., Alard et al., and Raleigh et al. to provide the fulfilled limitations of the instant claimed invention for improving the communication system.

Regarding claim 10, Hammons, Jr. et al., Alard et al., and Raleigh et al. differ from the instant claimed invention that they do not show that wherein at least one part of the coset addressing values produced by the coset selecting coder comprises a non-derived value.

However, Hammons, Jr. et al. discloses the use of unmodulated code words (means for non-derived value) within the encoder (column 5, lines 55 – 60).

While Raleigh et al. discloses a selecting encoder coupled to receive information (column 24, line 43 to column 25, line 21), which comprises bits. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to be easily producing coset addressing values.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Hammons, Jr. et al., Alard et al., and Raleigh et al. to provide the fulfilled limitations of the instant claimed invention for improving the communication system.

Regarding claim 11, Hammons, Jr. et al., Alard et al., and Raleigh et al. differ from the instant claimed invention that they do not show that wherein the encoder comprises a signal entity selector coupled to the coset selecting coder, the signal entity selector for multi-dimensional constellation entity related to the coset addressing values produced by the coset selecting coder, a multi-dimensional constellation entity forming at least part of the codeword of the systematic recursive space-time code.

However, Raleigh et al. discloses a selecting encoder coupled to receive information (column 24, line 43 to column 25, line 21), which comprises bits, for selecting a multi-dimensional value (column 5, lines 43 - 51. Thus, it would have been obvious to one of ordinary

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skill in the art at the time of the invention was made to be easily producing coset addressing values.

While Hammons, Jr. et al. discloses the use of code words of the systematic recursive space-time code (column 1, lines 63 – 67 and column 17, lines 52 - 53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Hammons, Jr. et al., Alard et al., and Raleigh et al. to provide the fulfilled limitations of the instant claimed invention for improving the communication system.

Regarding claim 12, Hammons, Jr. et al., Alard et al., and Raleigh et al. differ from the instant claimed invention that they do not show that wherein the signal entity selector generates a binary representation of the multi-dimensional constellation entity.

However, Hammons, Jr. et al. discloses the use of binary within the systematic recursive space-time code (abstract).

While Raleigh et al. further discloses a multi-dimensional value (column 5, lines 43 – 51).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Hammons, Jr. et al., Alard et al., and Raleigh et al. to provide the fulfilled limitations of the instant claimed invention for improving the communication system.

Regarding claim 13, Hammons, Jr. et al., Alard et al., and Raleigh et al. differ from the instant claimed invention that they do not show that the limitations analyzed in claim 12 wherein the signal entity selector is further coupled to receive at least one of the first values and where the multi-dimensional constellation entity selected at the signal entity selector is further related to the at least one of the first values.



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However, Raleigh et al. further discloses a selecting encoder coupled to receive information (column 24, line 43 to column 25, line 21), which comprises bits, for selecting a multi-dimensional value (column 5, lines 43 – 51) related to the information allocation (column 24, lines 15 0 17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Hammons, Jr. et al., Alard et al., and Raleigh et al. to provide the fulfilled limitations of the instant claimed invention for improving the communication system.

Regarding claim 15, the limitations are analyzed in the same manner set forth as the combination of claims 1 and 4.

Regarding claim 16, the limitations are analyzed in the same manner set forth as the combination of claims 1, 4, 8, and 11.

Regarding claim 17, the limitations are analyzed in the same manner set forth as the combination of claims 1, 4, 8, 11, and 12.

Regarding claim 18, the limitations are analyzed in the same manner set forth as claim 12.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

#### **U.S. Patent Documents:**

Hammons, Jr. et al. (U.S. Patent No. 6,560,295 B1) discloses a method of generating space-time codes for generalized layered space-time architectures.

Werbos (U.S. Patent No. 6,532,454 B1) discloses a stable adaptive control using critic designs.

De Lind van Wijngaarden et al. (U.S. Patent No. 6,241,778 B1) discloses a method and its corresponding apparatus for implementing run-length limited and maximum run codes.

Gootesman (U.S. Patent No. 6,128,764) discloses a quantum error-correcting codes and devices.

Citta et al. (U.S. Patent No. 6,044,083) discloses a synchronous CDMA communication system.

U.S. Application Documents:

El-Gamal et al. (Application # 10/011,831) discloses a method and its corresponding system for utilizing space-time codes for block fading channels.

El-Gamal et al. (Application # 10/012,950) discloses a method and its corresponding system for utilizing space-time overlays for convolutionally coded systems.

**Contact Information**

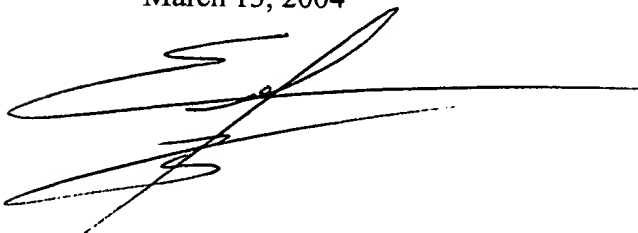
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung X. Nguyen whose telephone number is (703) 305-4892. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Ghayour Mohammad H. can be reached on (703) 306-3034. The fax phone numbers for this group is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800.

DXN

March 13, 2004

A handwritten signature in black ink, consisting of several loops and a long horizontal stroke extending to the right.